

the servo gate signal described in the specification. The reference head is now better defined in the claims, and the selected head is defined as a head to which switching is directed. Reconsideration and withdrawal of the § 112 rejection is respectfully requested.

With respect to the invention generally, a reference head is a standard head used for measuring the discrepancy time. In one embodiment, the reference head 0 and discrepancy times are stored between the head 0 and the other heads 1, 2 and 3, for devices having two disks. In single disk type devices, the reference head is head 0 and stored discrepancy times between the head 0 and the heads 0 and 1 (there are only two heads), are stored. The discrepancy time between the reference head 0 and itself is 0, so the time determination is performed by the algorithm of Fig. 4. The invention can also be applied to devices having two or more disks. Reconsideration and withdrawal of the § 112 rejection is respectfully requested.

Applicant understands that the examiner has not completed his prior art search, but will comment on the prior art, in the interest of expediting prosecution.

Tinger discloses a servo control method using a staggered servo format (see col. 1, lines 54-49 and Fig. 2). That is, Tinger discloses the same technique shown in Fig. 14 of this application as prior art. Further, Tinger discloses FRAME COUNTER 540 and FRAME OFFSET defining the offset of the Ref-SGATE signal from timing mark detection in the servo field by TMD 520 (see col. 5, lines 5-50). In Tinger, the FRAME OFFSET values vary for each head, but are determined from base timing of the ref-index which is

common to all heads and indicates a top of a FRAME PERIOD (see Figs., 4, 5, 6, 7, 8 and 9).

In contrast, in this invention, as especially described in Fig. 2 and Fig. 4, memory 16 stores discrepancy times between a reference head and each head, and switching servo gate timing is performed by reading T_a between the reference head and the present head, and T_b between the reference head and switched head. The time difference $T_d (=T_a - T_b)$ is calculated, and the time difference T_b is set as servo gate timing.

Therefore, head switching time can be reduced and fast head switching enabled in this invention.

For the foregoing reasons, applicant believes that this case is in condition for allowance, which is respectfully requested. The examiner should call applicant's attorney if an interview would expedite prosecution.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1 and 8 were amended as follows:

1. (Twice Amended) A head positioning control method for a storage disk device which comprises;

a storage disk having two recording faces, each recording face storing
~~that stores a position signal~~signals;

a plurality of heads that read information from the said storage disk, one
of the heads being a reference head, each head reading information from a different recording
face of said storage disk;

an actuator that moves ~~the said head~~heads; and

a control circuit that positions ~~the said head~~heads based on the position
signal read from ~~the~~said recording face of said storage disk, by using a selected head, said
method comprising:

a step of synchronizing a time of a detection signal for detecting said
position signal with a time of said position signal read by a~~said~~ selected head to which
switching is directed, in response to a head switching cue; and

a step of reading said position signal from an output signal of ~~for~~ said switched and selected head in response to said synchronized detection signal and positioning the said switched head according to said read position signal,

wherein said synchronizing step comprises:

a step of determining a time ~~at which the switched head reads~~ for reading said position signal from said output signal of said switched head, in response to said head switching cue; and

a step of synchronizing the time of said detection signal with said determined time,

and wherein said determining step comprises:

a step of reading a first discrepancy time between a ~~said~~ reference head and a present head, and reading a second discrepancy time between ~~the~~ said reference head and ~~the~~ said switched head; and

a step of calculating the time difference between said first and second discrepancy times to determine said time.

8. (Twice Amended) A head positioning control device for a storage disk apparatus, comprising:

a storage disk having two recording faces, each recording face storing ~~that store~~ position signals;

a plurality of heads that read information from the said storage disk, one of said reference heads being a reference head, each head reading information from a different recording face of said storage disk;

an actuator that moves ~~the said head~~ heads; and

a control circuit that positions ~~the said head~~ heads based on the position signal read from ~~the said recording face of said storage disk, by~~ using a selected head,

wherein said control circuit comprises:

a synchronization circuit that, in response to a head switching cue, synchronizes the time of ~~the a~~ detection signal for detecting said position signal with the time of the position signal read by ~~a present head from which switching originates~~ said selected head to which switching is directed, and

a processing circuit that, in response to said synchronized detection signal, ~~read~~ reads the position signal from an output signal of ~~from the said present~~ selected head and, in response to the read position signal, positions the ~~present head~~ heads,

wherein said synchronization circuit comprises:

a memory for storing ~~each a~~ a discrepancy time between ~~a~~ said reference head and each said head; and

a circuit for determining a time ~~at which the head to which said switching is directed reads said~~ for reading said position signal from said output signal of a

said selected head to which switching is directed, in response to said head switching cue, and synchronizing the time of said detection signal with said determined time,

and wherein said circuit reads a first discrepancy time between ~~the~~said reference head and a present head and a second discrepancy time between ~~the~~said reference head and ~~the~~said switched and selected head; and calculates the time difference between said first and second discrepancy times to determine said time.